Queues Structures

Queue data structure appears everywhere in our daily lives. In any queue, objects enter the queue and exit whenever the activity they have been waiting for is available.

Content Learning Objectives

After completing this activity, students should be able to:

- Identify the features and behavior of a queue ADT - Abstract Data Type

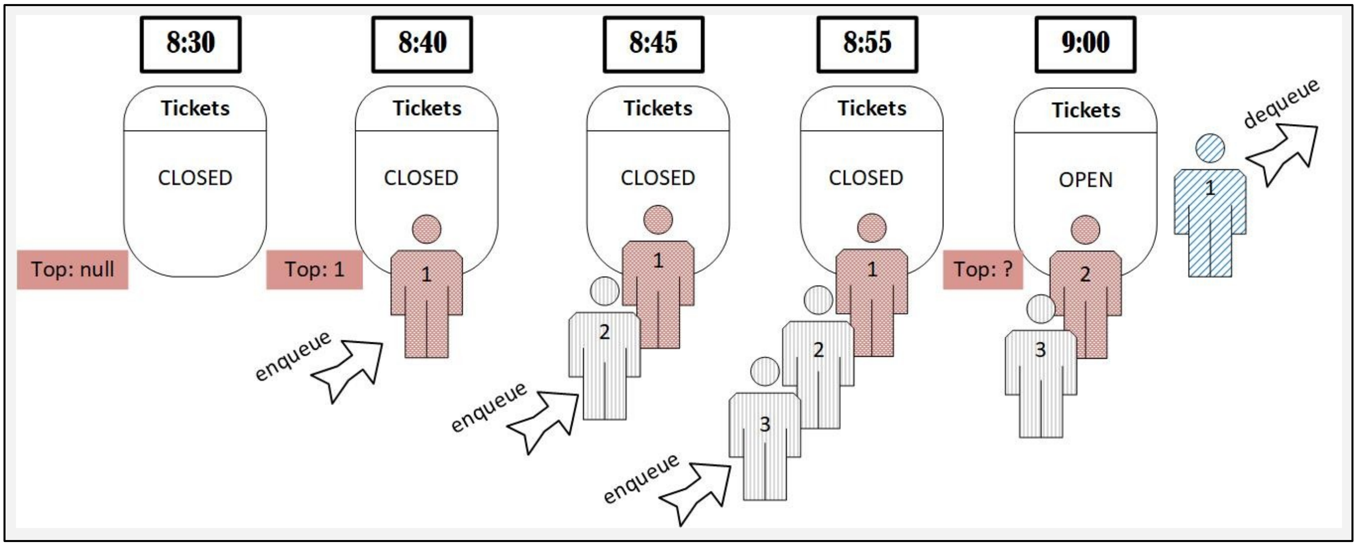
Process Skills Goals

During the activity students should make progress towards:

- Connect the elements presented in the model to concepts related to queues, including elements of a queue class (Information Processing)

Model 1 Queue Representation

The following model is a schematic representation of a queue formed in front of a ticket booth at a movie theater:



Questions (15 minutes)

1. **Give examples of queues from everyday life.**

2. **Describe what happens in the model, at each timestamp.**

3. **What is the value of the top of the queue at various moments?**

4. **What are the possible actions of the people/objects as related to the line/queue?**

5. **Describe the mechanism of the queue, in terms of the order of objects/elements in and out.**

6. **First person arrives at 8:40, and the rest of them arrive at 2 minutes intervals. How many people would be in line by 9:00? Could this be a problem? Should the line have a capacity defined? If so, what happens if the capacity is reached? Are there other actions that people may take?**

7. **Using the model, design a class Queue, listing the instance variables, as well as methods. Use UML notations to indicate the types of variables, including arguments for methods as well as their return type. Include a potential method that helps illustrate the situation mentioned in question 6.**

8. **As a group, assess your ability to design the class based on the given model.**

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